



August 22, 2022

Federal Highway Administration
West Building Ground Floor, Room W12-140
1200 New Jersey Avenue SE
Washington, DC 20590-0001

Submitted online via regulations.gov

Re: Federal Highway Administration Docket No. FHWA-2022-0008
Notice of Proposed Rulemaking: National Electric Vehicle Infrastructure (NEVI) Formula Program

Shell¹ is pleased to offer these comments in response to the above-referenced Notice of Proposed Rulemaking (“NPRM”) to inform the Federal Highway Administration’s (“FHWA”) and Joint Office of Energy and Transportation’s (“Joint Office”) minimum charging standards and requirements for the National Electric Vehicle Infrastructure (“NEVI”) Formula Program.

Shell is committed to a low carbon transportation future and is working to provide more renewable and low-carbon energy options for customers in support of its Net Zero Emissions target for 2050². Shell aspires to be the world’s leading EV charging solutions provider and has a goal of operating over 500,000 charge ports globally by 2025 and 2.5 million by 2030. Shell supports every part of the customer journey, offering charging infrastructure solutions for businesses – including fleets, Shell retail sites and destinations, and more. From generating renewable electricity to helping customers decarbonize their transport, Shell is building an ecosystem around the customer, developing the technology and the infrastructure to make electric mobility economical, convenient, safe, and reliable for more and more drivers in the years to come.

Policy and regulation are key enablers in the transition to electric mobility. Shell believes requirements should support a seamless experience for the end user (the EV driver) and foster private investment and stimulate innovation, while minimizing burdens or hurdles that could discourage market participation. Shell offers the following recommendations and encouragements in its comments below:

Recommendations

¹ In these comments, “Shell” refers to Shell USA, Inc. along with its US affiliates.

² See: <https://www.shell.com/energy-and-innovation/the-energy-future/our-climate-target>

1. Shell recommends removing authority for state departments of transportation (“DOTs”) to determine “reasonable” uses of program participants’ charging income, which could dampen private investment and deter the development of a robust EV charging market (§ 680.106 (m))
2. FHWA and the Joint Office should require states to grandfather existing charging infrastructure already deployed prior to the effective dates of National Institute of Standards (“NIST”) weights and measures regulation as a condition for receiving NEVI funding.
3. Enable technicians to perform installation and maintenance (§ 680.106 (j))
4. Shell notes that mandating a minimum uptime percentage alone is not enough to ensure reliability improves for NEVI-funded chargers (§ 680.116 (b))

Encouragements

5. Shell supports requiring Open Charge Point Protocol (“OCPP”) certification and seamless network switching in practice (§ 680.114)
6. Shell supports requiring chargers conform to ISO 15118 (§ 680.108)
7. Shell supports mandating inclusion of contactless payment methods for NEVI-funded chargers (§ 680.106 (f))
8. Shell supports requiring the CCS Type 1 connector for NEVI-funded stations (§ 680.106 (c))

Recommendations

1. Shell recommends removing authority for state departments of transportation (“DOTs”) to determine “reasonable” uses of program participants’ charging income, which could dampen private investment and deter the development of a robust EV charging market (§ 680.106 (m))

The NPRM’s proposal to establish state DOT oversight and authority over NEVI-funded charging station revenue is concerning for a number of reasons. Broadly speaking, considerations around return on investment (“ROI”) for EV charging stations are closely held and confidential for both public and private companies. If this provision remains, and state DOTs leverage it, it is likely that a percentage of entities otherwise interested in deploying publicly accessible EV charging stations and accelerating the Bipartisan Infrastructure Law’s vision of a nationwide public fast charging network may be reluctant to deploy stations with NEVI funding. This could have a chilling effect on private investment and defer or delay the buildout of a NEVI-funded nationwide fast charging network.

The reasons why the NPRM is proposing such DOT oversight are unclear. The NPRM indicates that such DOT oversight of program income is similar to “limitations on use of revenues for toll roads, bridges, tunnels, and ferries found in 23 U.S.C. 129” (p. 37271). In Shell’s view, EV charging stations are certainly a different type of infrastructure than these other types of infrastructure investments cited by the NPRM, and therefore do not warrant similar treatment around DOT oversight of charging income. Broadly speaking, in terms of commercial operation and use, EV charging stations are privately owned and operated and are more similar to dispensers of commodity fuels such as automotive gasoline and diesel than to public infrastructure investments such as toll roads, bridges, tunnels and ferries.

In addition to the chilling effect it could have on private investment, DOT oversight over charging income raises fairly significant questions and concerns about how such oversight would be exercised. It is unclear what processes state DOTs would establish, the extent to which such processes and

procedures would vary from state to state, how much access the public would have to private commercial information, what criteria state DOT officials would use to determine a “reasonable” return, how such DOT processes would align with related proceedings at other agencies such as public utility commissions, and the practical implications of how such processes might significantly delay deployment of charging stations.

For these reasons, Shell recommends removal of these provisions related to DOT authority and oversight over program income.

2. FHWA and the Joint Office should require states to grandfather existing charging infrastructure already deployed prior to the effective dates of National Institute of Standards (“NIST”) weights and measures regulation as a condition for receiving NEVI funding.

Shell believes the ability of EV charging equipment to accurately measure electricity in commercial transactions and provide for consistent, clear, and transparent transactions for drivers is a key enabling factor to unlock driver and consumer confidence in EV charging. Shell also sees a strong need for FHWA and the Joint Office to provide more clarity on the enforceable status of NIST Handbook 44, Section 3.40 to states in the context of the NEVI program and to send a clear signal to EV charger manufacturers. Without clear direction to grandfather existing chargers, NEVI-funded chargers risk becoming stranded investments.

NIST Handbook 44, Section 3.40 – EV Fueling Systems – establishes EVSE load tests at an acceptance tolerance of 1.0% and a maintenance tolerance of 2.0%. At its July 2022 Annual Meeting, after the NPRM was released, four members of the National Conference on Weights and Measures (“NCWM”) brought forward a “priority” proposal to remove the tentative code status of Handbook (HB 44, Section 3.40) for EV charging systems. Despite the objections of industry, other stakeholders and some regulators, NCWM removed the tentative provision, with a mitigating concession that select elements of the code would not be enforced for DCFC until 2028. The tolerances now take effect January 1, 2023 for Level 2 chargers and January 1, 2028 for DC fast chargers, with no provisions for grandfathering.

Despite NCWM’s action, there remain two developing items, EVF 21.1 and EVF 21.5 at the NIST Specifications and Tolerances (“S&T”) Committee that were brought forward via the Form 15 process in August of 2020. As directed by the S&T Committee, the submitters have diligently worked toward refining these proposals as they are critical items that must be addressed in order to make Section 3.40 workable and enforceable given current and future EV charging technology. This has included significant engagement with the Work Group on EV Fueling run by NIST staff and ensuring that feedback continues to be incorporated.

NCWM’s abrupt and unexpected action to enable states to enforce the code – without the necessary modifications that industry has been working through via the established code-making process for more than two years – presents potentially quite detrimental implications to not only the continued deployment and operation of public EV charging infrastructure, but infrastructure that is already deployed – or will be deployed prior to the effective dates of NIST Handbook 44, Section 3.40.

NWCM’s action has direct implication for NEVI-funded deployments and requires attention by FHWA and the Joint Office. The collective efforts of governments and industry should be focused on new,

additive charging infrastructure – as NEVI is. This is already an immense challenge and cost, without unnecessary risks posed to existing infrastructure work and development. Moreover, we note that a number of states predicated their NEVI planning and analysis on the permanence or useful life of already installed chargers in their respective states. NCWM's actions throws much of that planning and analysis into doubt, for the reasons described above.

While enforcement of select elements of NIST code for DC is delayed until 2028 per NCWM's select concessions, the majority of the code for DCFC is also enforceable on January 1, 2023, including retroactively for DC fast chargers already in the ground. The National Type Evaluation Program (NTEP) is not even open yet for DCFC, likely making any organization's ability to comply infeasible.

In addition to DCFC-specific concerns, NCWM's actions introduce serious questions around the permanency of existing Level 2 chargers for which there is no grandfathering and no delayed implementation. Although Level 2 chargers are not directly implicated by the NEVI program vision, corridor charging is reasonably able to be understood to be complementary to deployed longer dwell Level 2 charging deployed in an array of parking areas across the country.

While metering accuracy issues may be less of a challenge for Level 2 chargers, the expectation that manufacturers would put models through a retroactive type evaluation process – including legacy chargers they might no longer be selling – seems highly doubtful. Even if this was theoretically feasible, and every site host with legacy Level 2 chargers had the full support of the charger manufacturer to pursue and obtain type approval for old chargers, and provide retrofit/upgrade services as likely would be required in many instances, site hosts or owners may lack the financial ability and/or desire to do this. This would pose a significant risk of chargers being prematurely taken out of service before the conclusion of their useful life. Continuing along this scenario, even if state or federal funding agencies were to make funding available to perform these hypothetically possible upgrades to already deployed chargers, this would not be a prudent use of public infrastructure funds which are broadly intended to support deployment of new charging stations. California estimated the cost of retrofitting a Level 2 AC charger to be compliant with NIST code, if possible at all, to be roughly \$5,000.³ Retrofitting the roughly 66,883 public AC chargers in the United States currently installed (excluding those in California⁴) would cost approximately \$330 million.

Shell recognizes that some states may choose to take more moderated approaches to enforcement than what NCWM's action now allows for. Furthermore, in states that may allow for retroactive enforcement of chargers already in the ground, local county weights and measures officials themselves may choose a more pragmatic approach. That said, the very purpose of national weights and measures code is to create certainty and consistency for industry and regulators across the different states and local jurisdictions. Unfortunately, while well meant, what NCWM has enabled directly undermines that consistency, forcing likely distracting legislative and regulatory engagements that industry will have to undertake across many states, and uncertainty in how officials may enforce the code across the different local counties and jurisdictions. This scenario poses the very real risk of site hosts and

³ https://www.cdfa.ca.gov/dms/pdfs/regulations/EVSE_ISOR.pdf

⁴ California is the only state that has implemented a version of Handbook 44 for EV charging. Even though California has implemented a version of Section 3.40, it established key provisions that ensure that existing EV charging equipment does not have to be removed or replaced. In California, DC charging equipment installed before 2023 can continue operating and is exempt from the standards until 2033. For AC/Level 2, EVSE installed prior to 2021 is exempt until 2033.

developers ultimately needing to decommission existing chargers before the end of their useful life, directly undermining the goals of the NEVI program.

In the context of NEVI, Shell is concerned that failure to establish consistent and rational grandfathering will risk stranding significant public and private investment. Indeed, lack of grandfathering could implicate a need to replace or retrofit all NEVI-funded chargers deployed prior to the provision's January 1, 2028 effective date. This would severely impede achieving NEVI's vision of a "convenient, reliable, affordable, and equitable charging experience for all users."⁵ Through the establishment of minimum charging standards and requirements, FHWA and the Joint Office are in a unique position to induce a coherent and uniform national approach to this significant issue by leveraging the weight of NEVI funding and associated guidance.

For these reasons Shell respectfully urges FHWA and the Joint Office to address this significant challenge and impediment to the forward progress of charging infrastructure development, by establishing weights and measures-related certainty. FHWA and the Joint Office can provide needed consistency, certainty, and protection of existing charging assets by requiring states, as a condition for receiving NEVI funding, to grandfather from enforcement of NIST weights and measures regulation any charging infrastructure already deployed prior to the January 1, 2023 effective date for Level 2 charger tolerances and the January 1, 2028 effective date for DCFC tolerances. The date for grandfathering cut off could be set for AC chargers installed up to 1 year after NTEP issues a full type approval for the first AC product, and for DC chargers installed up to 1 year after NTEP issues a full type approval for the first DC product. This would peg and limit the grandfathering to NTEP acknowledgment of commercially available EV chargers that can meet the code, while allowing reasonable time for supply chains to react and installations to occur.

3. Enable technicians to perform installation and maintenance (§ 680.106 (j))

Shell supports the intent behind Section 680.106(j) to ensure EV charging stations are installed and maintained safely by appropriately trained, licensed, and certified labor. A skilled and well trained workforce is key not only for safety, but to support high uptime over the life of the charging equipment by assuring it is kept and maintained in good working order. Shell notes, however, that while this section specifically calls for electricians, in many instances a trained technician may be equally if not more suitable to perform implicated tasks than an electrician. Limiting this requirement only to electricians may be unnecessarily restrictive and costly, and could result in deployment delays. Shell therefore recommends consideration of a more flexible standard that allows for either trained electricians or technicians, when and where appropriate.

4. Shell notes that mandating a minimum uptime percentage alone is not enough to ensure reliability improves for NEVI-funded chargers (§ 680.116 (b))

Uptime and reliability are critically important elements to ensure a positive driver experience, inspire EV adoption decisions by drivers, and – particularly relevant to NEVI – deliver value for taxpayer funded investments. Indeed, the effectiveness of government and the charging industry in addressing charging infrastructure reliability and the driver charging experience will play an important role in the timeline in

⁵ Rogers, Andrew. (Feb. 10, 2022). Memorandum announcing 90-day NEVI Program Guidance. Federal Highway Administration.

which the market can move past the early adopter phase. As the NPRM notes, current uptime requirements for publicly available chargers range from none to 99% (p. 37273). However, it is the general dearth of uptime requirements historically that is a key factor contributing to inconsistent charger uptime across the industry. Another related factor is improperly funded charger deployments that may not have included adequate or realistic budgeting for service and maintenance. This inadequate operations and maintenance (“O&M”) planning, budgeting, and delivery can result in chargers being inoperable for extended periods of time even when the chargers ostensibly have minimum uptime requirements. An important observation, therefore, is that minimum uptime requirements, by themselves, do not in fact assure for or guarantee uptime either that meets the requirement regardless of what percentage is prescribed, or importantly, that meets driver expectations.

Shell recognizes the need for reliable infrastructure and is committed to maximizing the uptime in our network. There is a shared interest for this between those operating the network and those using it, as a higher uptime will not only lead to a better charging experience for EV drivers, but equally so ensures higher utilization rates for those owning the charging stations. EV charging industry experience has demonstrated that regulators, program administrators, and the industry are collectively responsible for setting appropriate uptime requirements as well as planning and budgeting for achievement of any requirement set. The NPRM attempts to address this by requiring greater than 97% uptime for a period of five years, and allowing associated O&M expenses as eligible for reimbursement. However, this alone is insufficient to ensure that any uptime expectations are met.

State deployment plans and plan administration should appropriately value and competitively score applications based on the extent to which the proposals sufficiently plan and budget to achieve the uptime level to which they are committing. Even with O&M being an eligible expense, if a state is otherwise scoring or evaluating applications on cost competitiveness, there remains an incentive for industry to underbudget or cut costs around O&M, if the alternative means increasing costs and O&M budgeting relative to the competition. This could very well result in many funding applicants committing on paper to meeting any uptime requirement, but not putting in place the plans, conditions, and budgeting to actually achieve it.

To mitigate the risk of sites not meeting the uptime requirement, the NEVI guidance to states could be to value and competitively score funding applicants based on their demonstrated planning, readiness, track record, budgeting and other factors that support achieving the uptime metric. This can and should include valuing and scoring service level agreements that specifically address actions and associated response times when problems occur, minimizing exclusions from the uptime calculations. These may include pre-paying for O&M services with contractual agreements with service vendors, and other planning and contractual measures to provide confidence that uptime commitments can and will be met. This approach is more likely to achieve NEVI’s uptime metrics than a less robust review process in which, for instance, applicants simply check a box stating they will meet an uptime requirement. Such an application process could result in a proverbial race to the bottom and increase the risk of repeating the mistakes of the past that have resulted in uptime that does not meet driver expectations or best enable mass market adoption. As noted above, balancing electrician-implicated and technician-implicated activities will help moderate costs of this type of service across the program.

Shell broadly supports the exclusions spelled out in the NPRM that should not be calculated against uptime “for reasons outside the charging station operator’s control.” That said, program administrators may wish to encourage reporting the raw, underlying data, rather than just the rolled up uptime percentage that provides an incomplete picture as to what was excluded or how the uptime figure was arrived at. This is important for transparency, and the ability to evaluate potential discrepancies between driver experience and funding recipient reporting.

Encouragements

5. Shell supports requiring Open Charge Point Protocol (“OCPP”) certification and seamless network switching in practice (§ 680.114)

As Shell discussed in its comments submitted in response to RFI No. FHWA-2021-0022, Shell supports requiring full and security certificate OCPP certification for NEVI-funded chargers. Shell encourages clarifying and revising the NPRM’s treatment of OCPP in three areas.

First, federal standards should require independent, third-party OCPP certification rather than relying on EVSE network operators to self-certify. As noted in January comments,

“Not all EVSPs that market their products as OCPP-compatible enable the seamless network switching which OCPP is intended to support...To address this shortcoming, the Open Charge Alliance (OCA) – the open and transparent organization that oversees the protocol – has implemented a third-party certification program with independent testing laboratories around the world, including in the United States.”⁶

Second, in order to facilitate such independent third-party certification of OCPP, Shell encourages requiring conformance with the most recent version of OCPP for which certification is available, rather than stipulating a specific version number such as version 2.0.1 which the NPRM references (§ 680.120). Not only do many commercially available chargers not support version 2.0.1, certification is not yet available for it.⁷ However, Shell is supportive of forward-looking in this area, and could see, as an example, a version 2.0.1 or similar requirement for year two — assuming certification is available by then — and helping enable it — as an effective means for advancing industry and third-party certification readiness.

Third, and likely most importantly, EV charging industry experience has shown it is insufficient for chargers to be designed to support switching networks via OCPP conformance alone; true interoperability requires the network provider to also actively facilitate such network switching without imposing penalties or other costs.

Shell is deeply concerned that language in Section 680.114 (a)(6) would be inadequate to ensure this seamless interoperability (“Chargers must be designed to securely switch Charging Network Providers without any changes to hardware,”). We strongly encourage strengthening this language by requiring the products and services of hardware manufacturers and charging providers leveraged by funding

⁶ Shell USA. (January 27, 2022). Comments in response to RFI No. FHWA-2021-0022, at p. 10.

⁷ See: <https://www.openchargealliance.org/certification/ocpp-201-certification/>

recipients to contractually commit to enabling network switching of charging hardware receiving NEVI funds without charging additional fees or otherwise hindering implementation, after the conclusion of any initial contractual term.

A charger that is *technically* able to switch networks will still not be able to if it is *functionally* or otherwise locked to a specific network, or the manufacturer refuses to support repointing it to another network, even when the charging hardware is technically able to do so.

6. Shell supports requiring chargers conform to ISO 15118 (§ 680.108)

Shell shares the NPRM’s perspective that the widespread support for – and stakeholder participation in developing – the ISO 15118 standard warrants its inclusion in the NEVI minimum standards and requirements. ISO 15118 is the only non-proprietary, published open standard for charger-to-vehicle communication designed to enable and support full interoperability across multiple elements of the EV ecosystem and use cases, including smart charging, plug and charge, bidirectional charging and more. It is also the only such standard for this specific and important communication pathway between chargers and vehicles for which vehicle OEMs are deploying in their vehicles at scale. Therefore, ensuring that chargers can also communicate via this standard is critically important for “future proofing”, avoiding stranded assets, avoiding stranded investments by automakers, making the charging experience seamless, and meeting driver and grid integration needs.

As described in Section 680.120, ISO 15118 has several parts. However, the NPRM omits ISO 15118-20, which is the second-generation network and application protocol requirements, with ISO 15118-2 being the first version (drafted in 2014). ISO 15118-20 was published in April 2022⁸ and provides extended technical capabilities in terms of smart charging that are essential for grid support and a coordinated, flexible management of the energy transfer. Further, ISO 15118-20 includes additional features such as bidirectional and dynamic charging, which are not included in ISO 15118-2. Shell recommends including ISO 15118-20 in the NPRM.

As Shell noted in its January comments in response to RFI No. FHWA-2021-0022: “Though the current ISO 15118-2 version remains an important bridge to the new standard, Shell is not supportive of a short-lived mandate of ISO 15118-2 and instead supports the acceleration of ISO 15118-20 adoption in the market. Shell supports the full ISO 15118-20 specification inclusive of its optional and mandatory features and advises against a mandate of only selective features, as this would limit the standard’s ability to fulfill ecosystem needs and would compromise interoperability.”⁹

As Shell further noted in its January comments, a physical transceiver chip is a necessary hardware component for chargers to support ISO 15118 communication – or any communication with the vehicle for that matter – in order for it to be hardware ready for ISO-15118 enabled capabilities. While DC fast chargers generally already have this hardware readiness, this has not historically been common for Level 2 chargers. While Shell supports the NPRM’s proposed language that “chargers must conform to ISO 15118,” Shell believes this language can and should be strengthened and potential ambiguities addressed by specifying that specific hardware readiness needed to support the standard and enable

⁸ <https://www.iso.org/standard/77845.html>

⁹ Shell USA. (January 27, 2022). Comments in response to RFI No. FHWA-2021-0022, at pp. 15-16.

EV-to-EVSE communication is required. This mirrors the approach the state of California took in providing guidance around support for the standard and the capabilities it unlocks.¹⁰ FHWA and the Joint Office may wish to adopt California’s definition of “ISO 15118-ready”, which is specifically a charger that is capable of, at a minimum:

1. Powerline carrier (“PLC”) based high-level communication as specified in ISO 15118-3.
 2. Secure management and storage of keys and certificates.
 3. Transport Layer Security (“TLS”) version 1.2; additional support for TLS 1.3 or subsequent versions is recommended to prepare for future updates to the ISO 15118 standard.
 4. Remotely receiving updates to activate or enable ISO 15118 use cases.
 5. Connecting to a backend network.
 6. Selecting the appropriate communication protocol used by the vehicle.
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7. [Shell supports mandating inclusion of contactless payment methods for NEVI-funded chargers \(§ 680.106 \(f\)\)](#)

Shell supports the NPRM’s emphasis on ensuring that the NEVI-funded charging network is widely accessible to drivers. As Shell noted in its January comments in response to RFI No. FHWA-2021-0022: “Credit card payment options for public charging are...a foundational element of payment interoperability for those [drivers] that are not members of an applicable charging network, for those without smartphones, and in a number of other situations.”¹¹

Contactless payment methods such as RFID-enabled communication align with the direction the market is heading, and they create less risk than other credit card reader technologies of component parts failure that could negatively impact charger uptime. For these reasons, Shell supports the proposed language in the NPRM to require contactless payment methods.

[8. Shell supports requiring the CCS Type 1 connector for NEVI-funded stations \(§ 680.106 \(c\)\)](#)

The NPRM takes the right approach in requiring the Combined Charging Solution (“CCS”) Type 1 connector for all NEVI-funded fast chargers, while allowing states the flexibility to support CHAdeMO or other connectors with non-NEVI funding. This approach reflects the reality that excepting Tesla the North American market has coalesced around the CCS Type 1 port as the de facto North American standard. This market alignment is perhaps best illustrated by Nissan, maker of the CHAdeMO-compatible Nissan Leaf, which recently announced its new Ariya EV would support CCS Type 1 and not CHAdeMO.¹²

In Shell’s view, allowing NEVI funds to finance CHAdeMO-equipped chargers would be backwards-facing and would dilute the available funding in a way that could fail to support a consistent fast charging

¹⁰ <https://efiling.energy.ca.gov/GetDocument.aspx?tn=241955>

¹¹ Shell USA. (January 27, 2022). Comments in response to RFI No. FHWA-2021-0022, at p. 16.

¹² Goodwin, A. (July 15, 2020). “Nissan Adopts CCS Fast-Charging With New Ariya Electric SUV.” Road Show by C|Net. <https://www.cnet.com/roadshow/news/nissan-ariya-electric-suv-adopts-ccs-fast-charging/>

experience. Shell supports the NPRM's approach of allowing NEVI funds to only finance CCS Type 1 ports, which is a forward-facing posture and aligned with the direction in which the market is heading.

Conclusion

Shell is excited about the NEVI program and partnering with states and FHWA and the Joint Office to realize the vision of NEVI and an accessible network of EV charging infrastructure. Thank you for your consideration of these comments.

Sincerely,

A handwritten signature in black ink, appearing to read 'T. Broughton', with a stylized flourish at the end.

Terry Broughton
General Manager e-Mobility North America
Shell USA, Inc.